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THE GENUS *PACHODYNERUS* (HYMENOPTERA, VESPIDÆ) IN THE ANTILLES¹

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The key to the Antillean species of *Pachodynerus* and the appended brief notes on their synonymy and distribution are extracted from a large manuscript covering the vespidae fauna of these islands. They will help to clarify the affinities of a new Cuban species recently received from Dr. S. C. Bruner, who kindly presented the types to the Museum of Comparative Zoölogy.

1. Thorax very short and high, nearly cubical, scarcely longer than wide. Postscutellum crossed by a sharp, finely crenulate ridge. Superior ridge of propodeum with a complete, high, translucent lamella. Edge of first abdominal tergite evenly rounded in profile, not bluntly angular, with minute, scattered punctures. Ocellar area more or less grooved. Clypeus of male with a median pair of low longitudinal humps. Black, with pale brownish-yellow markings; abdomen dull, with appressed short hairs; head and thorax with longer, somewhat silky pubescence *P. nasidens*.

Thorax either markedly longer than wide or (in *alayoi*) superior ridge of propodeum incomplete, not lamellar. Black with bright yellow markings, sometimes partly ferruginous-red. Body dull or more or less shiny, without appressed short hairs and without silky pubescence 2.

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2. Edge of first abdominal tergite bluntly angular and slightly swollen at the junction of basal slope and apical horizontal area, the latter with coarse punctures. Superior ridge of propodeum with a complete lamella; concavity with strong transverse striæ and coarse punctures. Interocellar area slightly grooved. Clypeus of male with medium-sized punctures and a median pair of low longitudinal humps. Inner margin of mandible of male with the basal tooth low and broad. Black; head and thorax with many yellow markings; tergites 1 and 2 and sternite 2 with apical yellow bands; legs mostly ferruginous-red *P. jamaicensis*.
 Apical horizontal area of first abdominal tergite minutely punctate. Concavity of propodeum either mostly smooth or finely transversely striate 3.
3. Superior ridge of propodeum low and irregular, not forming a complete lamella. Thorax only very slightly longer than wide. Edge of first abdominal tergite not angular, evenly rounded at the junction of basal slope and apical horizontal area. Interocellar area grooved. Clypeus of male with medium-sized punctures, without median longitudinal humps. Inner margin of mandible of male with the basal tooth low and broad. Black; head, thorax and legs profusely marked with yellow; tergites 1 and 2 and sternite 2 with apical yellow bands. *P. alayoi*.
 Superior ridge of propodeum with a complete, high sometimes translucent lamella. Thorax distinctly longer than wide 4.
4. Edge of first abdominal tergite not angular, evenly rounded at the junction of basal slope and apical horizontal area. Interocellar area slightly grooved. Clypeus of male with minute sculpture and a median pair of low longitudinal humps. Inner margin of mandible of male with the basal tooth high, triangular. Black; head, thorax and legs profusely marked with yellow; abdomen with apical bands and sometimes (var. *sancti-vincenti*) with lateral spots on tergite two *P. gadulpensis*.

Edge of first abdominal tergite bluntly angular and often slightly swollen at the junction of basal slope and apical horizontal area 5.

5. Interocellar area flat or scarcely depressed. Clypeus of female coarsely punctate; of male slightly longer than wide, with medium-sized punctures, without median longitudinal humps. Inner margin of mandible of male with the basal tooth low and broad. Black; head, thorax and legs profusely marked with yellow; tergites 1 and 2 and sternite 2 with apical yellow bands (also two discal spots on tergite 2 in var. *barbouri*) *P. tibialis*.

Interocellar area distinctly grooved. Clypeus of female with medium-sized punctures; of male about as long as wide, with medium-sized punctures and a median pair of low longitudinal humps. Inner margin of mandible of male with the basal tooth high, triangular 6.

6. Sculpture of head and thorax very coarse; pronotum, scutellum and postscutellum almost rugoso-reticulate. Cheeks rather swollen in profile, at least half as wide as the eye at the occiput. Colored much like *P. cubensis* in typical form, but the apical abdominal segments often less extensively ferruginous or entirely black; in var. *bahamensis*, base of first abdominal tergite extensively ferruginous-red.

P. scrupens.

Sculpture of head and thorax dense, but moderately coarse, not rugoso-reticulate. Cheeks barely swollen in profile, less than half as wide as the eye at the occiput. Black; head and thorax profusely marked with yellow; tergites 1 and 2 and sternite 2 with apical yellow bands (much widened at the sides of tergite 1); base of flagellum, femora and apical segments of abdomen more or less extensively ferruginous-red *P. cubensis*.

1. *Pachodynerus nasidens* (Latreille, 1817). *Odynerus simplicicornis* de Saussure (1855), described from Cuba, I regard as a synonym, being unable to find any consistent difference between Cuban and continental American speci-

mens. The wasps recorded as *O. brachygaster* from Cuba, by H. Lucas and Gundlach, were also *P. nasidens*. I have never seen the true *P. brachygaster* (de Saussure, 1853) from any of the Antilles. *P. nasidens* is widely distributed throughout most of Central and South America and is at present spreading outside the New World. It is common in Cuba, Hispaniola, Jamaica and Puerto Rico. In the Bahamas it has only been taken thus far in New Providence. I have seen a specimen labelled Miami, Florida, no doubt an accidental introduction. Whether *Pachodynerus acuticarinatus* (Cameron), of Texas and Arizona, and *P. pulverulentus* (Viereck), of Arizona and Southern California, are specifically or racially distinct from *P. nasidens* is as yet undecided.

2. *Pachodynerus jamaicensis* Bequaert and Salt, 1931. This species is restricted to Jamaica. It includes the wasps recorded from there by Fox, Ashmead, and Gowdey as *O. tibialis*, and by Gowdey as *O. gadulpensis*, two species I have never seen from Jamaica.

3a. *Pachodynerus gadulpensis* (de Saussure, 1853), typical form. Originally described from Guadeloupe, this form of the species is found in most of the Lesser Antilles. I have seen it from Antigua, Montserrat, Dominica, Martinique, St. Lucia, the Grenadines (Canouan I.), Grenada, and Barbados. Published records from Jamaica and Trinidad were based on misidentifications. *Odynerus gadelupensis* Dalla Torre (1904) is an emendation of *O. gadulpensis*. According to the types, at British Museum and U. S. National Museum, *Odynerus grenadensis* Ashmead (1900) is not separable from *gadulpensis*; the structural characters are the same, while the apical bands are not actually absent on the tergites behind the second, as implied in the original description, but are dirty orange or ferruginous, instead of yellow, evidently an artificial discoloration. Similar discoloration may be seen in some specimens from the other islands. The dorsal face of the pronotum is sometimes wholly yellow, as stressed by de Saussure; more often it bears on each side a small discal, triangular black spot.

3b. *Pachodynerus gadulpensis* var. *sancti-vincenti*

(Ashmead, 1900). I have seen the types of *Odynerus sancti-vincenti* at the British Museum and at the U. S. National Museum, as well as two additional females collected in St. Vincent by J. Ogilvie. Structurally these wasps agree with *P. gadulpensis* from the other Lesser Antilles, but they are more abundantly marked with yellow. The apical band of the first tergite extends along the sides and often projects somewhat inward along the edge of the slope. Usually also there is a free discal yellow spot on each side of tergite two. In some of the types these spots are very small or barely indicated. I have not seen them in any *gadulpensis* from any of the other Antilles. So far as known at present var. *sancti-vincenti* is peculiar to St. Vincent.

4a. *Pachodynerus tibialis* (de Saussure, 1853), typical form. So far as known, this form is restricted to Hispaniola and the neighboring Mona Island. It is black, with fairly numerous yellow markings on head, thorax and legs; but clypeus, mesopleura and propodeum are mostly black; tergites 1 and 2 and sternite 2 have a broad yellow margin, but there are no yellow discal spots.

4b. *Pachodynerus tibialis* var. (or subsp.) *barbouri*, new.

Female.—Black, with the following parts yellow: entire clypeus; narrow margin of lower inner orbits; streak along upper outer orbits; small interantennal spot; basal spot on mandible; scape beneath; much of dorsal area of pronotum; most of mesopleura, tegulæ and propodeum (broad center of concavity black); postscutellum; broad apical margins of tergites 1 and 2 and sternite 2; that of tergite 1 abruptly widened and extending somewhat mesad along the edge of the slope; that of sternite 2 extensively widened on the sides; a spot on each side of tergite 2 narrowly divided from the yellow margin; most of coxæ; apical portion of fore and mid femora; apical spot on hind femora; tibiæ except for a narrow inner black streak. Structurally like the typical form, except that the lamellar superior ridge of the propodeum is not straight but wavy, forming a broad upward curve midway between the lateral angle and the postscutellum. If this

peculiarity is found consistently in other Bahaman specimens, *barbouri* may have to be raised to specific rank. The unknown male may furnish additional characters.

Bahamas: Great Inagua, female holotype, February 26, 1934 (Utowana Expedition.—M. C. Z. No. 27832).

Named for the late Dr. Thomas Barbour, in appreciation of his lifelong interest in the Antillean fauna.

5. *Pachodynerus alayoi*, new species.

Male.—Similar to *P. guadulpensis* and *P. tibialis*, except for the following. Interocellar area deeply grooved, with longitudinal swellings near the posterior ocelli; the latter slightly farther apart than their distance from the eyes. Ridge between antennæ low, not carinate. Clypeus slightly higher than wide, relatively narrower in upper area than in *tibialis*, the inner orbits being slightly over one and one-half times as far apart on the vertex than at the narrowest of the clypeus; surface barely convex, without median longitudinal humps; lower free portion much shorter than upper interocular part; truncate apex relatively narrower than in *tibialis*, less than one-third of the greatest width of the clypeus. Mandible as in *tibialis*, the inner margin with the basal tooth low and broad. Thorax seen from above scarcely longer than greatest width, relatively shorter than in *tibialis*. Propodeum: superior ridge poorly developed, except close to the lateral angle where there is a short, low carina; elsewhere the coarse sculpture of the dorsal areas extends beyond the ridge onto part of the concavity as medium-sized punctures; lateral angle low, blunt. First abdominal tergite not in the least angular at the junction of basal slope and horizontal apical area, as evenly rounded off as in *guadulpensis*.

Head and thorax very coarsely punctate, almost rugoso-reticulate, much as in *jamaicensis*; but concavity of propodeum mostly smooth, with a median area of a few, weak transverse striæ. Clypeus with scattered medium-sized punctures, about as in *tibialis* and *jamaicensis*. Sculpture of abdomen as in *tibialis*.

Black, without ferruginous, with the following areas yellow: clypeus; most of lower half of face; a broad

streak along upper outer orbits; a large basal spot on mandible; scape, except for a black streak above; broad humeral margin of pronotum (including carina); two spots on scutellum; most of postscutellum; a large spot on upper mesepisternum; most of dorsal areas of propodeum, the yellow continued over the sides close to the lateral angles; most of tegulæ; legs except for coxæ and part of femora, the tarsi darker, more or less ferruginous; and broad apical margins on tergites 1 and 2 and on sternite 2, not abruptly widened at the sides. Wings as in *tibialis*.

Length (h. + th. + t.1 + 2), 7 mm.; of fore wing, 6 mm.

Female.—Except for the usual sexual differences, like the male in structural characters and color markings. Clypeus about as high as wide, the inner orbits about one and one-third times as far apart on the vertex as the narrowest of the clypeus; lower free portion about as long as upper interocular part; surface coarsely and densely punctate. Clypeus yellow, with a narrow median black streak over apical half.

Length (h. + th. + t.1 + 2), 8 mm.; of fore wing, 7 mm.

The absence of a complete lamellar ridge between the dorsal areas and the concavity of the propodeum is unusual in *Pachodynerus*. It differentiates *P. alayoi* not only from all other Antillean species, but also from most of those found elsewhere, except *P. peruensis* (de Saussure).

Cuba: Siboney near Santiago de Cuba, male holotype, May 5, 1940 (M.C.Z. No. 27829); Ciudamar near Santiago de Cuba, female allotype, January 18, 1948; both collected by Mr. Pastor Alayo.

6. *Pachodynerus cubensis* (de Saussure, 1853). Known only from Cuba, where it seems to occur everywhere, being one of the characteristic elements of the fauna.

7a. *Pachodynerus scrupus* (Zavattari, 1912), typical form. Found in Cuba, where it appears to be rare (Preston and Banes, in Oriente; Santiago de las Vegas), and more commonly in the Bahamas (Cat I.; New Providence; Rum Cay; Eleuthera). Most of the Cuban specimens are colored much like *P. cubensis*; but the yellow markings

are somewhat more extensive, while the ferruginous color covers more of the flagellum. In some Cuban specimens the apical abdominal segments are as extensively ferruginous-red as in *cubensis*; in the Bahaman specimens they are almost wholly black. One Cuban specimen, however, is in this respect like those of the Bahamas, so that the Bahaman wasps without reddish on the base of the first tergite do not seem to be racially distinct from the Cuban ones.

7b. *Pachodynerus scrupeus* var. *bahamensis* Bequaert and Salt, 1931. This form differs from typical *scrupeus* in the first tergite of the abdomen being tricolored, broadly red at base (to beyond the angular edge), narrowly black in the middle, and banded with yellow at apex. The terminal segments of the abdomen are black in all specimens seen. Known only from the Bahamas: New Providence; Andros I. (Andros Cay); Long I. (Clarence-town); Watling I.; Rum Cay.

Male (undescribed).—Similar in color to the female, except that the clypeus is entirely yellow. Structurally it agrees with the male of typical *scrupeus*.

Allotype from New Providence, Bahamas, May 1, 1932 (J. G. Myers). Both holotype and allotype at M.C.Z. (No. 27832).

PUPAL PARASITES OF TABANIDÆ.—To complete the record the following references should be appended to my note on the pupal parasites of the Tabanidæ (Bailey, 1947). The chalcid *Diglochis occidentalis* Ashmead, of the Pteromalidæ, was reported as a parasite of three species of *Chrysops*, namely *C. excitans*, *C. mitis* and *C. moerens*, by Cameron (1926) and Philip (1931) found four pupæ of *C. mitis* parasitized by this species in Minnesota. These were previously overlooked. References: Bailey, N. S., 1947, *Psyche*, 54(2): 142; Cameron, A. E., 1926, *Bull. Ent. Res.*, 17(1): 39–40; Philip, C. B., 1931, *Minn. Agric. Exper. Station Tech. Bull.*, 80: 68.—N.S. BAILEY, Biological Laboratories, Harvard University.